

REMARKS

Applicant respectfully requests reconsideration of this application in view of the foregoing amendment and following remarks.

Status of the Claims

Claims 1-20 are pending in this application. By this amendment, claims 1-20 are cancelled without prejudice or disclaimer. New claims 21-32 are added. No new matter has been added by this amendment.

Rejections under 35 U.S.C. §§102 and 103

Claims 1-10, 12, 14-18 and 20 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,813,233 to Okuda et al. ("Okuda").

Claims 11, 13 and 19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Okuda in view of U.S. Patent No. 6,098,408 to Levinson et al. ("Levinson").

Claims 1-20 have been rejected as shown above rendering the rejections directed to these claims moot.

New Claims

Claims 21-32 have been added to recite the claimed invention in an alternative manner. Added independent claim 21 recites a cooling apparatus for cooling an optical element of an optical system in a vacuum atmosphere. The cooling apparatus of claim 21 comprises: a radiational member; a Peltier element; a control system to control temperature of said Peltier element; and a heat transfer system to flow a coolant via a second surface, opposite to the first surface, of said Peltier element, said heat transfer system keeping temperature of the coolant substantially the same as a reference temperature of the optical system.

With the feature of claim 21, the coolant can be thrown by the heat transfer system in substantially the same temperature as a reference temperature of an optical system, such as a target temperature of the object to be cooled or a reference position member of the optical system. See, for example, page 22, line 15 through page 25, line 10 of the original specification.

Applicant believes that none of the cited references (i.e., Okuda and Levinson), taken either alone or in combination, shows or suggests this aspect of the invention as featured in claim 21 as discussed above. Claim 21 and dependent claims 22-32 depending from claim 21 either directly or indirectly are accordingly believed to be allowable for at least the reasons discussed above.

IDS

Applicant submits herewith an Information Disclosure Statement (IDS) including three references, i.e., Japanese Laid-Open Patent Application No. 2003-058258 ("JP1"), Japanese Laid-Open Patent Application No. 2004-029314 ("JP2") and Japanese Laid-Open Patent Application No. 2004-039696 ("JP3").

JP1 discloses a locating apparatus that includes a heat exchanging part having a Peltier element to exchange the heat by radiation. JP1, however, does not teach the aspect of the invention as featured in claim 21 as discussed above.

JP2 discloses an optical element cooling apparatus that includes the heat receiving board 3 for receiving the radiation heat from the mirror 1, the cooling mechanism 5 for cooling the heating board 3, and the heat shielding mechanism 8 (the heating apparatus 7 and the second heat receiving board 9). However, the cooling mechanism 5 is composed of the heat pipe 4 and the water cooling jacket 6 for carrying the heat from the heat pipe 4, should lower the temperature of

the water cooling jacket 6 more than the temperature of mirror 1. This is undesirable because the temperature of the water cooling jacket 6 influences the temperature of an object (e.g., other mirrors) other than the object to be cooled.

JP3 discloses a mirror apparatus that includes the mirror, radiation board to radiation cool the mirror, and the temperature adjusting mechanism of the radiation board including the Peltier element. JP3, however, does not teach the aspect of the invention as featured in claim 21 as discussed above.

Moreover, these references (i.e., JP1, JP2 and JP3) do not discuss the influence of the temperature of the coolant thrown by the heat transfer system as specifically recited in claim 21.

Accordingly, claim 21 and dependent claims 22-32 depending from claim 21 either directly or indirectly are believed to be allowable for at least the reasons discussed above.

Applicant believes that the application including the added claims is in condition for allowance and such action is respectfully requested.

AUTHORIZATION

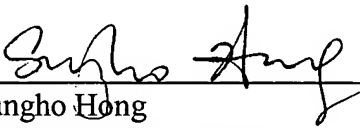
No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicant hereby petitions the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 13-4500 (Order No. 1232-5091). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

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By:


Sungho Hong
Registration No. 54,571

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 Telephone
(212) 415-8701 Facsimile